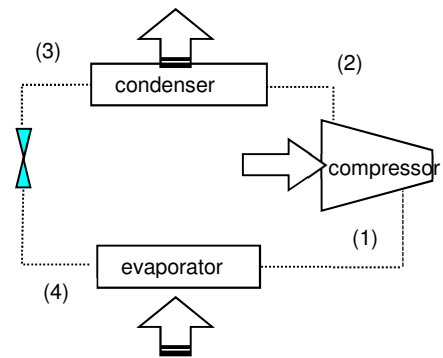

EXAMPLE: Ideal vapor-compression refrigeration cycle

An ideal vapor-compression refrigeration cycle uses R-134a as a working fluid in an air-conditioning system. The refrigerant enters the compressor as a saturated vapor at 40°F and leaves the condenser as a saturated liquid at 130°F. The mass flow rate of the refrigerant is 1.5 lbm/s.



- Find the power into the compressor, in B/s.
- Find the heat transfer rate out of the condenser, in B/s.
- Find the heat transfer rate into the evaporator, in B/s.
- Find the COP for the cycle.
- Find the quality of the refrigerant at the exit of the valve.
- Repeat with an isentropic efficiency for the compressor of $\eta_c=0.85$.

